

Biotic and Abiotic Factors Influencing Aspen (*Populus tremuloides*) in Arizona

Quaking aspen (*Populus tremuloides*) is the most widespread tree species in North America, but reduced regeneration throughout western North America has raised concerns about stand resilience and persistence among land and wildlife managers. The geographic area experiencing aspen decline is broad enough and the temporal scale is narrow enough that the term ‘sudden aspen decline’ was coined to



describe the generality and speed of the phenomenon. Declining aspen populations are problematic because aspen stands often represent biological hotspots of diversity surrounded by dominant conifer or meadow types in western forests.

Many factors have been proposed to affect aspen regeneration and recruitment, among them altered land management practices, conifer succession, wildfire, disease, climate change, and herbivory. It remains unknown how the multiple contributing factors combine to drive changes in aspen populations and their distribution.

Objectives

1. Investigate how aspen stands in Arizona have recently (i.e., over the past 30 years) been affected by a suite of relevant covariates, and to determine the relative contributions of the set of landscape-level covariates on the observed expansion, contraction, or persistence of aspen stands over time.
2. Determine the relative importance of relevant landscape-level covariates in characterizing the condition of contemporary aspen stands.

Approach

The activities of this study are focused at two temporal and spatial scales of investigation. The first takes advantage of available remote sensing products to examine how aspen populations have changed in Arizona over the past three decades and to identify specific aspen stands that have expanded, contracted, or remained unchanged. The second relies on detailed field data collected from changing aspen stands to characterize how environmental factors are impacting aspen forest health.

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